E/CONF.39/C/430
SUMMARY
5 Nov.1962
ENGLISH
ORIGINAL : RUSSIAN

UNITED NATIONS CONFERENCE
ON THE APPLICATION OF SCIENCE AND TECHNOLOGY
FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

SUMMARY

Agenda Item: C.7.2

Byelorussian SSR

THE INCREASE OF THE WOOD PLANTING GROWTH

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N° 1836
C.7.2.

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SUMMARY

The increase of forest productivity by enhancing growth is determined primarily by the process of plant nutrition. Hence, the regulation of the latter process and its peculiar aspects comprises the most basic problem of the forest husbandry industry which can be solved by means of a thoroughly developed effect upon the environmental factors. These factors are liable to cause deviations in the process of photosynthesis and mineral nutrition of plants. The improvement of the mineral nutrition in arboreal plants, especially their calcium (liming) and phosphorus feeding plays an important role and stimulates the growth of woods in the dernpodzolic areas of Byelorussia which prove to be strongly podzolisized sandy-loam soils. The introduction of even lime alone at a dose of 2-5 ton/ha and more increases growth of plants, for example, such as oaks spruce, ash, elm up to 53-138%. Lime together with phosphorus fertilizers (in the latter case the order is of I.0-I.5 centner (ha) can be introduced into the forest area without being covered by soil; it can be easily mechanized with the aid of sprinklers.

The necessity to fertilize the indicated soils is especially evident, if one takes into account the following. The discharge of calcium (which is impossible in the course of the biological turnover) by the mixed oak forest of 50-70 years old amounts to I.0-I.5 ton/ha; this is almost equal to the gross reserves of this element in the top soil layer of 30 cm.; calcium ranges within I.3-I.7 tons/ha/CAO/. And, it should be noted that the amount of phosphorus involved into the seasonal biological turnover (soil-forest-soil) even in the coniferous woods related, true enough, to the higher class of the bonitet of 40-60 years is determined at the figure of up to 150 kg/ha or 60-70% of the compounds easily digested by the plants and formed in the soil. The foliaged woods takes in more phosphorus because the leaves are 20% richer with phosphorous than coniferous species.

The total productivity of standing timber is also greatly dependent upon the productivity of photosynthesis in the assimilative apparatus, which in turn relies upon the light regime formed in the woods during the vegetative period. As a result, during the growth period in trees there is a maximum development in those plantings which reveal a considerable mass of foliage or conifera needles (over 30%) and receive in the course of a light day an optimum (or close to it) elucidation : for example, pine is exposed to light at the order of 6.5-8. 0 thousand lux. The formation of the indicated plantings is being carried out by means of felling which is performed in accordance with a definite intensity, namely : the standing pine trees are rarifies till the tree crowns are completely joined with each other at 0.7. The cutting down of trees in connection with maintainance in the nonjoined plantings (where the completeness is less than 0.7) cannot increase the current growth because partial selective felling of trees reduces the number of trees and the most important point is that a greater exposure of the assimilative apparatus leads to

a progressive decrease of the conifer as capacity for productivity. The rarification is carried out mostly at the cost of the trees which belong to the Vth, IV and 1st classes of growth and development or elucidation and also of the III candidates ascribed to the IVth class. In the standing timber which have been formed according to these lines the trees of the II and III classes appear as the basic "producers" of timber; the latter are responsible for over 60% of the annual growth which is totally 20-40% higher than in the dense or rare plantings (with a completeness of more or less 0.5). These trees reveal the highest purely seasonal productivity of photosynthetic activity owing to the most favourable exposure to light of their assimilative apparatus in the canopy of the locked plantings. It is worth noting that in the sites of utmost locked standing timber, where the productivity of work performed by the leaves or conifera needles is at its height, the water discharge and involvement of the nutrient elements into the seasonal biological turnover in regard to a unit of newly formed organic substance are at their lowest level. Under similar plantings, to a greater extent than under rarified or dense plantings, the productive capacity of soils expressed in the yields of economically valuable products produced by a unit of wooded area is increased. Thus, the development of this product is viewed as the basic problem of the forestry economy.

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